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ABSTRACT

The adaptation and use of Programmed Instruction (PI) in adult basic education (ABE) are focused upon. Objectives of this paper are to cite evidence that PI is being used successfully in correctional institutions, to suggest reasons for this success, and to show that PI works best in the context of a broader learning system where individually prescribed and managed instruction is the goal. A brief questionnaire survey in the use of PI was conducted in 150 major state adult correctional institutions throughout the nation and the Federal Bureau of Prisons. Ninety-seven per cent reported their institutions experiencing success in the use of PI. Reasons given by respondees for the success of PI include: (1) permits individualized instruction, (2) self-paced, (3) students like it, (4) no competition (with others). In addition, 37% of users of PI systems reported that they had developed effective approaches, such as contingency management and performance contracts. The Federal Bureau of Prisons, a major consumer of PI, states that it is committed to the continued use of PI and to development of more sophisticated contexts, such as training systems and contingency management. Draper Correctional Center has experimented with developing a model basic education program in which PI is the primary instructional method. This method has four steps: Diagnosis, Prescription, Managing the Instruction, and Evaluation. (CK)

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THE USE OF PROGRAMMED INSTRUCTION IN CORRECTIONAL INSTITUTIONS*

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Programmed instruction (PI) as currently viewed by educational leaders is an essential tool of the education revolution which began in the early 1960's. This method of instruction appears to be gaining recognition and an increasingly widespread use wherever education and training occur--in business and industry, public schools, mental hospitals, manpower development and training programs, and in correctional settings. This paper will focus on the adaptation and use of PI in adult basic education in correctional institutions. The objectives of this paper are to cite evidence that PI is being used successfully in correctional institutions and to suggest reasons for this success and to show that PI works best in the context of a broader learning system where individually prescribed and managed instruction is the goal.

Early History of PI in Corrections

One of the earliest significant attempts to use PI in corrections was reported in 1961 in a research grant application to the National Institute of Mental Health (NIMH) by McKee (1962), who had conducted his work at Draper Correctional Center in Alabama. In support of this application, a nine-month demonstration study with forty inmates related the following findings:

(1) Self-instructional programs can be successfully used with confined offenders.

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(2) Side effects were of particular importance: Intellectual interests expanded--more books were read; requests for dictionaries and encyclopedias were made by the experimental subjects; inmates began writing programs themselves.

(3) Programs were discovered to be needed in relatively unexplored areas, such as in etiquette and personal grooming, in vocational subjects, in institutional orientation and adjustment for both inmates and correctional officers, with special attention given to format and level of presentation for those who could hardly read and write.

(4) Structure was found to be essential for effective operation of a self-instructional program. Rules, tests, and feedback of progress to the learner were recognized as necessary.

(5) Lost educational time can be retrieved by prisoners who had been school dropouts.

The application to NIMH was approved in 1962. Regular periodic reports submitted to NIMH described the establishment of a "Self-Instructional School" and the achievements and problems in the use of PI in basic education. At the same time that the use of PI was being explored in basic education, an attempt was made to demonstrate its applicability in vocational training. A vocational shop in radio and television repair was set up, and basic electricity and electronics courses were programmed at Draper and administered to approximately 200 inmates over a two-and-one-half-year period. Progress in these uses of PI was reported and an operational plan, using inmate assistants and paraprofessionals, was described (1967).

The next significant example in the use of PI in corrections was reported by Cohen, Filipczak, & Bis (1965) in the CASE Project at the National Training School for Boys. They sought to apply to programmed courses certain operant-psychology procedures, such as point accumulation (with backup reinforcers) for every correct response made by the student and cumulative recording of correct responses and errors. Periodic reports published by the CASE Project (1967) cited successful use of PI: Students produced; they made substantial gains on academic achievement tests; and they were enthusiastic consumers of this form of education.

Perhaps elsewhere within the nation's correctional setting, PI was being examined, tried out in a variety of ways, and ideas were being formulated about its relative effect in teaching the offender population. The most published reports of experiences and measures of success again came from Draper and from the NTSB CASE Project. As they grew in expertise, each ferreted out the problems which needed attention if the use of PI were to be developed into a systematic technology. For example, whereas Draper had reported highly motivated trainees in early 1962, its use of PI in a manpower training program soon encountered motivational problems in this broader setting. CASE's system was proving effective in keeping students motivated but there appeared to be little way to ensure the generalization of prosocial behaviors developed in training to community adjustment. An adaptation of the CASE Project's point system was tried out in the Draper manpower development and training program. In addition, the Draper group soon turned to another aspect of using PI to motivate its manpower trainees:

the diagnostic-prescriptive process which was designed to uncover specific basic education deficiencies and to treat them in terms of the academic skills needed to master certain vocational skills.

Unrefined as each may have been, both the Draper and the CASE projects were by early 1967 achieving some rather dramatic results. As a result, the attention of others seeking innovative, feasible approaches to educating offenders soon brought the eyes of the nation to focus on these two early efforts. Educators visited, corresponded with, or sought technical assistance from project staffs in a relatively general effort to see what PI could offer to other educationally disadvantaged populations.

The Draper project moved on from experiment to experiment to find more systematic and effective ways to administer and manage the PI learning process. The birth of its systematic approach to the use of PI, with a documented account of its growing pains, were reported periodically in Manpower Development and Training Project progress summaries 1-16, 1964-68, and were culminated in the MDTA Final Report, Volume III - "How To With P.I.," October, 1968. Short, concurrent studies in motivation and contingency management conducted by the Draper NIMH project (McKee & Clements, 1967) fed into the Draper model to refine its overall effectiveness. Another arm of the Draper MDT project was busy developing programs in the subject areas for which relatively few programs existed. By early January, 1969, some thirty programs had been developed, validated, and disseminated to roughly 3,000 persons or agencies interested in the use of PI. Only three months later, this distribution figure had doubled.

High interest in the programs developed in the academic, vocational, and social skill areas, and a subsequent demand for the how-to manual (to date, some 1,200 volumes have been distributed, almost wholly upon request) led to the belief that the use of programmed instruction was finally "coming of age." Yet, there was only scattered, documented evidence of the use of PI in correctional settings. Cook County Jail in Chicago was using an adaptation of the Draper model in its overall program. The State of Hawaii had ordered fifty copies of the how-to manual for use in its system. California Youth Authority administrators met in a three-day workshop to examine more closely the use of PI in the correctional setting and have since instituted adaptations of the system in several of its correctional programs. Correspondence indicated further sporadic use of programmed materials. In view of the informational gaps in knowledge about the use of PI in correctional institutions, it seemed both appropriate and necessary to find out how the use of PI was faring in other of the nation's correctional institutions.

Current Use of PI

In preparation for this paper a brief questionnaire survey in the use of PI was conducted in 150 major state adult correctional institutions throughout the nation and the Federal Bureau of Prisons. Of a total of 82 replies from state institutions, 65 (79 per cent) reported the use of PI in basic education, vocational education, and related areas. Seventeen institutions (21 per cent) reported no use of PI. Curriculum committed to PI ranged from 1 per cent to 93 per cent, with the average being 25 per cent.

Ninety-seven per cent reported their institutions experiencing success in the use of PI. Table 1 describes the reasons for the successful use of PI given by those institutions reporting success.

TABLE 1

Successful Use of PI by Reasons
and Per Cent of Respondees

Reasons given by respondees	Per Cent*
Permits individualized instruction	77
Self-paced	72
Students like it	46
No competition (with others)	26
Other reasons	40

*Most of the 63 respondees listed more than one reason for success.

Only two institutions reported they had not been successful. The reasons cited were not enough money to purchase better programs and that "learning is superficial, does not carry over to other areas, and is soon forgotten."

Twenty successful respondees also cited some failures. The most frequently cited reasons were (1) student unmotivated and lacks sufficient initiative, (2) staff resistance, (3) boring and students don't like, and (4) difficult for slow learner.

A final question which elicited a number of interesting responses was, "Most users of PI believe that consistent success with

this instructional method requires the employment of systematic procedures in the management of programmed learning. Have you developed any effective approaches, such as 'contingency management,' performance contracts, etc.?" Thirty-seven per cent of the users reported they had. When asked to briefly describe approaches used, the most frequent responses were (1) performance contracts; (2) points accumulated with backup of a wide range of reinforcers; (3) use of paraprofessionals in the management of the educational program; (4) earlier parole consideration; and (5) eligibility for further training, such as vocational training, entrance into a GED preparatory program, and college correspondence courses.

The Federal Bureau of Prisons is a major consumer of PI. The Bureau reports that all of its 35 institutions employ PI to some degree in basic education, vocational training, high school equivalency preparation, driver education, social education, and "World of Work." Several institutions have written basic education programs, while one (Lompoc) has developed a teaching machine which is becoming extensively used both in the federal system and elsewhere. The Bureau states that it is committed to continued use of PI and to development of more sophisticated contexts, such as training systems and contingency management.

In summary, this survey of 150 major state adult correctional institutions shows that PI is being used successfully in over 75 per cent of these institutions. Of the 35 institutions included in the Federal Bureau of Prisons' survey, 100 per cent were involved in the use of PI. Analysis of the data showed that the more the curriculum

was committed to PI, the more the enthusiasm of the reporting educator, and the greater the use of PI, the greater the number of ystematic procedures employed.

The Draper Model

In recent years, Draper Correctional Center has experimented with developing a model basic education program in which PI is the primary instructional method. The staff at Draper recognized at the beginning that PI was the realistic and effective approach to individualizing basic education--a must for a population with which traditional methods had failed miserably. However, it was assumed, erroneously, in those early days that PI could markedly reduce the number of teachers and assistants required; that PI was so intrinsically motivating that the student could go on learning forever--captured by the inherent motivation which results from the feeling of success at every step through such long courses as English 2600 and TEMAC math. In short, staff was naive enough to think that all one had to do was to assign a PI course and the learner would do the rest.

The moment of truth came quickly. As the "Hawthorne effect" wore off, it was realized one had to get down to the business of constructing a system of learning. Attention had to be given to goals and aspirations of inmates--or instilling these through counseling and other types of interaction. The staff came to grips with the need to control distracting stimuli through the use of learning carrels and the improvement of management techniques. It became evident that a methodical diagnostic procedure was necessary for specifying knowledge deficiencies and prescribing precise remedial modular units of programs. Next,

evaluation measures were developed for feedback to manager as well as to learner. Finally, it was recognized that reinforcing contingencies of learning had to be discovered and scheduled in order for learning to be efficiently maintained.

Basic Steps in the Instructional System

To obtain optimum results in basic education, four fundamental steps are employed in the systematic use of PI materials at Draper. They are (1) diagnosis of learning deficiencies, (2) prescription of the specific materials which will correct these deficiencies, (3) management of the learning activities, and (4) evaluation of the trainee's progress and the system itself. Each of these steps is described below.

Diagnosis. As a first step in this procedure, a standardized achievement test is administered. From the results of this test, an item analysis of learning difficulties and deficiencies is prepared. In most cases, further diagnostic tests must be administered to determine more specific knowledge gaps.

Prescription. After completion of the diagnostic process, a prescription schedule for the learner is prepared, providing a record of the courses or modules to be assigned and the order in which the learner will take them. To prepare the schedule, the manager must consider the information gained from the diagnostic procedure. This information will include achievement test results (overall and subtest scores including a measure of the reading level of the trainee), an item analysis of the diagnostic test, and data on goals and interests obtained during interviews with the trainee.

The manager, having selected and ordered PI materials for his trainees, will be somewhat familiar with the materials from the standpoint of behavioral objectives, grade level, reading level, appropriateness for age level, and format (method of presentation). Keeping in mind the age and approximate grade level of the trainee, plus the information and insight he has obtained as to the trainee's abilities and interests, the manager weighs course objectives against learner deficiencies and selects the course (or modules). At this point the prescription is tentative; it will very likely require adjustments at intervals.

Managing the instruction. Before the trainee begins his studies, he should have a counseling interview with the manager. At this time the manager reviews and interprets the trainee's test scores and shows him how they were used to prescribe the programmed materials he will use. The explanation should be couched in terms of the trainee's goals. The trainee's commitment is secured to his prescribed course of study. Finally, the proper use of PI is explained, and testing and grading procedures are discussed.

Each day a performance contract, covering work-expectancy, is prepared with the trainee. Work-expectancy is an approximation of what the trainee can accomplish doing steady work for a three- to four-hour work period. The trainee is alerted to the fact that he will be tested at critical progress intervals within the work-expectancy period and that a passing score--at Draper, it is 85--will net him points that may be traded in for such reinforcers as money, special privileges, or other tangible items he might choose. The trainee

should be observed closely for the first few days to note any prescription errors that need immediate correction. Supervision must be maintained. To involve the trainee in his own learning process, verbal feedback, progress checks, and personal observations are all valuable tools which should be employed by the manager.

Evaluation. Evaluation is a continuous process which begins the moment the trainee comes under supervision. His progress is evaluated when his work is checked, during counseling sessions, and in all the day-to-day contacts with him. While the chief means of evaluation are his performance contracts, there must be some formal measure of his progress within a particular course and within the entire program. Several different forms of all tests should be available.

Before a trainee is tested, he receives a spot check of his written responses to verify the fact that he has indeed worked through the material covered by the test. After the test is administered and scored, the results are immediately reviewed with him.

When a trainee is leaving the program, or at stated intervals throughout the time he is under supervision, overall progress is measured. For this purpose a different form of the standardized achievement test is administered. A comparison of results provides a measure of the trainee's overall progress. A comparison of the item analyses (pre and post) of learning difficulties and deficiencies can measure the effectiveness of the prescribed modules. The comparisons provide the manager with feedback about the effectiveness of the PI materials and the accuracy of the prescriptions.

Contingency Management

Much of the operation just described was arrived at empirically, but the application of behavior principles, particularly those derived from reinforcement theory, has contributed heavily to the procedures employed.

Behavior is Controlled by Its Consequences

The theoretical underpinning of the Draper model starts out with the basic assumption that all learning takes place under specifiable conditions.

In the simplest of terms, the learner or trainee responds to a stimulus and following an appropriate response is given feedback signaling appropriateness. He may be told that his response is right, or that he did well, or any of a variety of positive consequences may follow an appropriate response. The important concept here is that his response is strengthened by what immediately follows it. Thus, a positive consequence is contingent upon an appropriate response. Contingency management is the formal administrative technique employed to provide positive consequences for all learning activities.

While the principles are simple, the effects of their systematic application have a powerful impact on motivation. Contingency management is becoming recognized by educators as necessary in creating a total learning environment. Maintaining learning behaviors at a high rate of efficiency requires the proper management of the three-fold learning contingencies--stimilus control, responses, and reinforcers.

Positive consequences of behavior are called reinforcers because they serve to strengthen or reinforce the behaviors that precede them.

The learner, not the teacher or contingency manager, is the sole determiner of what reinforces him. What is a reinforcer to one student is not necessarily a reinforcer to another. There are, however, reinforcers that are effective for most students: success in learning--good grades, mastery of subject matter or skills, approval of teachers and peers. However, these reinforcers may not be effective, especially with learners who have a history of repeated failure. This does not mean that contingency management has failed. What is required at this point is a search for reinforcers for which the student will work. The search begins with the student who is the expert in what reinforces him.

High-Low Probability Behavior

This search leads to another behavior principle:

(1) Given any two behaviors, an individual has a preference for the behavior he would rather engage in at a given moment.

(2) By allowing the individual to engage first in the less preferred behavior in order to be allowed to perform the more preferred behavior, the more preferred becomes a reinforcer to the less preferred.

(3) The more the less preferred behavior is performed, paired with the reinforcing event (RE), the more preferred it becomes. It can, in turn, be used to increase the probability of lower preference behaviors.

The following is a list of some contingency management procedures frequently used:

(1) Pairing high-low probability behavior

(2) Arranging RE menu and room

(3) Contracting for performance

(4) Systematizing progress plotting

(5) Managing one's own contingencies, e.g., arranging one's own performance contract, reinforcement schedule, etc.

(6) Employing a token economy.

Implications of Contingency Management for Model Development

In following the dictates of contingency management, a new learning environment will be created that will have instructional development, learning management, and evaluation as its main activities. The traditional role of the teacher as a dispenser of information and opinion will be de-emphasized; instead, he will constantly address himself to developing and implementing the model learning system. He will continually review training objectives, learning strategies, learning events, and evaluation methods. In short, he will become the manager of an instructional system.

The learning manager will spend most of his time managing learning contingencies. He will be available to students for consultation and assistance and will spend time meeting with students individually and in small groups. He will engage in evaluation of the whole program; learners will be evaluated in relation to established criteria, not in relation to each other.

An Experiment in Contingency Management

Clements and McKee (1968) conducted an experiment using contingency management procedures patterned after Homme (1966).

Contractual agreements and contingency management procedures were used in an attempt to increase the productivity of sixteen prison inmates studying programmed educational materials. The length of the experiment was nine weeks. The amount of PI work to be done by each subject was specified daily by means of a "performance contract." Although the amount was negotiable, the conditions of the experiment required each learner to increase his performance about 20 per cent each week over a baseline measure taken during a three-week period just prior to the beginning of the study. Following completion of a unit of work, the subject was allowed a fifteen-minute period in which he could either select an item from a reinforcement menu or opt to return to the study area.

The results of the experiment showed that under conditions of contingency management, productivity, as measured by frame output, almost quadrupled. Increased amounts of work were accompanied by greater work efficiency; total time in the work area per day decreased, and the number of frames completed per hour increased. Number of tests taken doubled; per cent of tests passed increased from 71 to 80.

Conclusion and Recommendations

PI works. It is working at Draper and is working in the adult basic education programs of at least 63 state and 35 federal adult correctional institutions.

But the successful users of PI realize that it is no educational panacea. PI does not provide the answer to rehabilitating the public offender, but it can help materially in achieving educational objectives for the prisoner which traditional methods have denied him. Properly used, it can cut significantly into time required to gain knowledge and learn skills.

The following considerations may prove helpful in planning and operating an instructional system using PI:

- Learn the underlying theoretical principles of PI, such as reinforcement learning theory, behavioral objectives, and contingency management. The theory will be needed for training staff and trainees and for providing a rational base for program changes and development.

- Get your staff committed to PI. Staff acceptance of PI critically affects the management of the system. Some ways of getting commitment are through training, systematic experimentation with PI, and group discussion. Staff must also receive reinforcement through success experience, which can be best provided by systematic use of PI.

- Recognize that PI has limitations. It is no substitute for human relationships, but it can facilitate them. A variety of group interactions is also desirable in basic education, but, even here, PI has a contribution to make: As PI has done, develop explicit objectives, stating in behavioral terms the things the trainee will be able to do as a result of his group experience. Then, seek to measure the outcome of the group method employed, such as discussion, role playing, and other forms of group instruction.

- Involve the trainee in planning and operating the instructional program. Allow him to perform as many duties as appropriate, such as keeping his own progress charts and

graphs, assisting other inmates, and orienting new trainees and visitors. Accord to the inmate the status of an adult trainee; avoid the designation student, which connotes lower status and frequently the absence of realistic goals of occupational skills and jobs.

- Relate as closely as possible basic education skills to occupational goals and work. This is easy to say but quite hard to accomplish. Adult Basic Education (ABE) programs, however, hardly exist in a vacuum: ABE only makes sense to disadvantaged groups if the skills learned are relevant to work or preparing for work. What is the relevance, for example, of First Year Algebra (TEMAC) for butchers and bricklayers and barbers? None. But an understanding of fractions for bricklayers is important for it is needed in estimating materials and surfaces and in taking measures. Serious effort must be made to relate ABE knowledges to life work. Counseling and demonstrations help, but more effective would be the ABE trainee's participation in an occupational training program where he could see the relevance unfold as he progressed through his training.

- Use small instructional units or modules more than extended programs. Modules allow pinpoint prescribing for deficiencies and also allow the trainee to experience the reinforcement value of quick task completion. Maintain a constant search for other reinforcers, remembering that the principal supply source is the trainee himself.

- Employ paraprofessionals, such as college students, to assist in the training system and provide them with adequate orientation and supervision. Bear in mind that with individually prescribed instruction the teacher manages and the program teaches the subject matter. This fact permits the use of some personnel with less requirements than a college degree and teaching certificates.

PI provides the technology for individualizing instruction on the most efficient and effective basis known to date. It is not a test, not a teaching machine, not a mechanical process. It is, however, a vital component of an instructional system which is now taking its first steps toward a valid instructional technology--a much-needed development for the entire educational field, especially in corrections.

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